Subject: Mathematics - Algebra I   Grade: Ninth

Standard: #1 Operations with Real Numbers
              #2 Formulas

Key Concept: Students work with real numbers and formulas.

Generalization: Students develop a formula to solve a problem.

Background:
    This lesson is adapted from student activity number one from the book <u>Algebra Magic Tricks Algecadabra! Volume 1</u>, ISBN # 0-89455-461-1 and should be presented early in an Algebra I course.

    Students should work in pairs or triads to complete this lesson. All tiers will complete a series of questions to help them be able to unravel the trick of "The Missing Eight" on pages 3 and 4 of the reference. Each tier should create a written solution and a formula for their solution.

    Only two tiers are presented here, you may want to give more directions for below grade level learners who may need more assistance unraveling the trick.

    The whole class is introduced to "The Missing Eight" trick by the teacher performing the trick with a volunteer from the class. Have students make observations about the trick and write these on the board. Next group students according to readiness and have them unravel the trick.

This lesson is tiered in ***product*** according to ***readiness***.

Tier I: ***Grade Level Learners***
    Students in this tier are given the three steps from the reference to unravel the trick. Students also answer the questions to ponder from the reference. In addition, students complete the extension activity number 2 from page 4 of the reference which has them develop a way to use a standard eight-place display calculator to compute the product 12345679 x 63 without causing an overflow.

Tier III: *Advanced Learners*

Students in this tier are not given any steps for unraveling the trick. They must devise their own solution and write up the steps. Students answer the questions to ponder from the reference after they have a solution. In addition, students investigate what happens to the products if 12345679 is replaced by 123456789, i.e. number 1, page 4 of reference.

Assessment:

The first part of the lesson should be graded for accuracy. The second half of the lesson could be presented to the class by the various pairs.

A homework extension of the lesson would be to have all students complete number 4 from Further Investigations on page 4 of the reference. This activity has students discover a pattern when 9 is multiplied times a series of numbers.